

Primary, secondary and tertiary haloalkanes and alcohols

QUESTION: Answer the following questions on primary, secondary and tertiary haloalkanes and alcohols

1) **Molecule 1** below can be classified as a tertiary alcohol. **Molecule 2** can be classified as a tertiary haloalkane.

$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3 - \text{C} - \text{CH}_3 \\ \\ \text{OH} \end{array}$	$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3 - \text{C} - \text{CH}_3 \\ \\ \text{Cl} \end{array}$
Molecule 1	Molecule 2

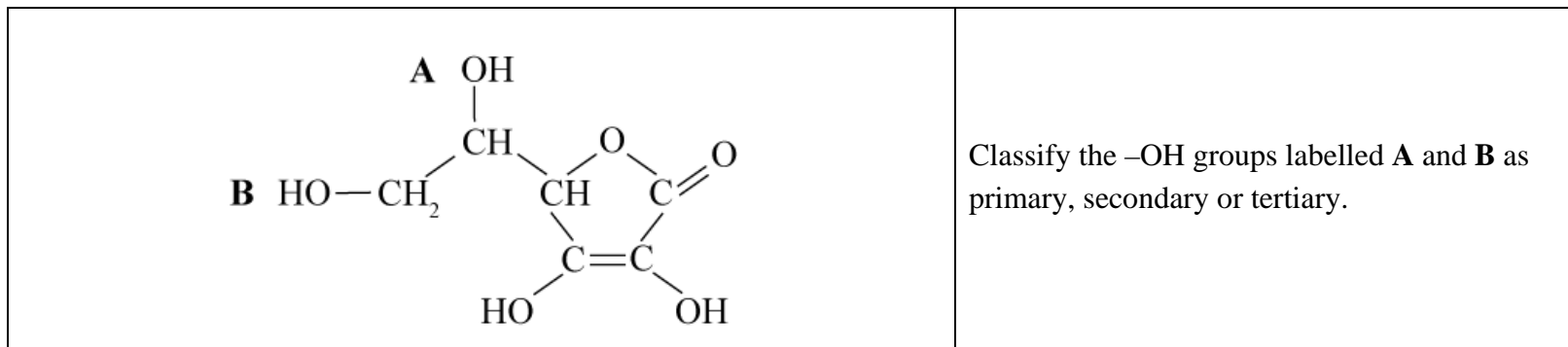
Describe why both these molecules can be classified as tertiary.

Explain why **Molecule 1** and **Molecule 2** are not structural isomers of each other. (In your answer, you should outline what a structural isomer is, and refer to both molecules.) Draw a structural isomer of **Molecule 1**

2) Classify each of the following alcohols as **primary**, **secondary** or **tertiary** and explain your answer for each substance

$\begin{array}{c} \text{CH}_3 - \text{CH} - \text{CH}_3 \\ \\ \text{OH} \end{array}$	$\begin{array}{c} \text{CH}_2\text{OH} \\ \\ \text{CH}_3 - \text{CH} - \text{CH}_3 \end{array}$
alcohol X	alcohol Y

3) Vitamin C has the following structure.



4) Four alcohols with the molecular formula $C_4H_{10}O$ are shown in the table below. Complete the table by classifying each alcohol as **primary**, **secondary** or **tertiary**.

Name	Structural formula	Classification
butan-1-ol	$CH_3-CH_2-CH_2-CH_2-OH$	
butan-2-ol	$ \begin{array}{c} CH_3-CH_2-CH-CH_3 \\ \\ OH \end{array} $	
2-methylpropan-1-ol	$ \begin{array}{c} CH_3 \\ \\ CH_3-CH-CH_2-OH \end{array} $	

2-methylpropan-2-ol	$ \begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3 - \text{C} - \text{CH}_3 \\ \\ \text{OH} \end{array} $	
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5)

Vitamin C has the structure shown on the right.	<p style="text-align: center;">Vitamin C</p>
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- a) On the molecule circle the section that is an alkene and would readily react to decolourise bromine water.
- b) Two of the -OH groups in the molecule have been labelled as (A) and (B). Classify these -OH groups as primary, secondary or tertiary alcohol groups.